UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,784	11/05/2003	Daniel Mark Coffman	YOR920030465US1 (163-15)	7433

24336 7590 03/04/2008	**EXAMINER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/701,784	COFFMAN ET AL.
	Examiner	Art Unit	
	Dorothy Sarah Siedler	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after t he mailing date of this communication, even if timely filed, may re duce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2007*.

2a)☒ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

December 12, 2007 has been entered.

Response to Arguments

Applicant's arguments filed December 12, 2007 have been fully considered but

they are not persuasive.

Applicant argues that *Ramaswamy* does not disclose the elements of

independent claims 1,12 and 23, specifically stating that, "Ramaswamy doe not teach or

suggest the preceding limitations of claims 1,12 and 23, but instead involves a multi-

tiered approach that, at a first stage, only outputs a target category for an utterance, but

not a target utterance." (Remarks page 11); however the examiner respectfully

disagrees. *Ramaswamy* discloses translator levels with a plurality of categories for

each translator level, where "each category may include formal language command

entries relevant to at least one application and may further include the step of applying

the formal language command entries to the at least one application in accordance with

the input command. The at least two categories may include the step of associating a

first portion of the entries with a given category by providing a formal command for each

of the entries relevant for the given category." (column 2 lines 49-58). *Ramaswamy*

also discloses that, "Translators 102 of a hierarchical NLU of the present invention

includes categorized formal commands. Categories, and nested sub-categories, of the

formal commands are defined and each formal command if assigned to one (or more) of

the categories and stored in models 104." (column 5 lines 54-58). In *Ramaswamy* the

input command is passed to translator levels, where each level including the initial level,

interprets the utterance and assigns it to a category and corresponding formal language

command(s) associated with that category. Thus *Ramaswamy* discloses, "the results

provided at a first stage by at least one of the at least two of the plurality of handlers

include one or more target utterance for the utterance" as stated in claims 1, 12 and 23.

Applicant also argues that, "Ramaswamy does not teach or suggest the use of

arbitration at all, but rather simply selects the category with the highest score."

(Remarks page 12). Applicant also asserts that, "in arbitration, a person or thing acts as

a judge to make a choice based on discretion"(Remarks page 13), this usage of

arbitration based on the definition provided by Webster's New World Dictionary of the

American Language. However, the examiner continues to assert that this interpretation

of arbitration is not supported in the specification. The specification, page 11, states

that, "The handlers 20 decide among themselves what the intended target is by

comparing features in the utterance to content stored in each handler to determine a

highest score (which may include weighting and other score modification techniques,

which may be known in the art)". The specification also states that questions are posed to each handler, as stated by applicant; however the specification continues to state that, "each enabled handler responds in the affirmative or the negative." (page 13). Thus, winning handlers, to be used to execute commands, are determined with the use of binary responses to questions, and scoring amongst the handlers; these methods do not support the interpretation of arbitration, as argued by applicant.

Applicant also argues that, "the cited portion of Ramaswamy discloses selecting a category (and not a winning handler as recited in these claims)". However the examiner respectfully disagrees. In *Ramaswamy*, the input command is passed to translator levels, each level then interpreting the utterance and assigning it to a category (winning handler) and corresponding formal language command(s) associated with that category, based on the probability or correct translation for each of the categories. Thus *Ramaswamy* discloses, "identifying/determining a winning handler" as stated in claims 1, 12 and 23.

Applicant also argues that *Ramaswamy* does not disclose or suggest that the, "command is decoded in accordance with the winning handler identified by arbitration" since, "Ramaswamy does not output a formal language command corresponding to the handler (translator level) but rather then associates the selected category with a next level of translators and ultimately output the formal language command from a last level of translators." (Remarks page 14). However, the examiner respectfully disagrees. In *Ramaswamy*, the input command is passed to translator levels, each level then interpreting the utterance and assigning it to a category (winning handler) and

corresponding formal language command(s), the category determined based on the

probability of a correct translation. The identified category (winning handler) is then

used in the next level of continued translation. Therefore *Ramaswamy* discloses

"decoding the command in accordance with the winning handler" as recited in

independent claim 1, 12 and 23.

Applicant's arguments with respect to claims 5 and 16 have been

considered but are moot in view of the new ground(s) of rejection. The applicant is

encouraged to refer to the rejection of clams 5 and 16 for further explanation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 10-12, 15, 21-23 and 26 are rejected under 35 U.S.C. 102(b) as

being anticipated by *Ramaswamy* (6,311,150).

As per claim 1, *Ramaswamy* discloses a method for recognizing commands in natural

language, comprising the steps of:

Comparing an utterance to a plurality of handlers (column 2 lines 25-65, *an input*

utterance is translated using a natural language understanding engine comprised of a

plurality of translator levels. Each level contains a plurality of categories with associated

formal language commands stored as models (handlers). The categories with

associated formal language commands are compared to the input utterance);

Identifying a winning handler for decoding a command from the utterance,

wherein the winning handler is identified by arbitration between results provided by at

least two of the plurality of handlers, and the results provided at a first stage by at least

one of the at least two of the plurality of handlers include one or more target utterances

for the utterance (column 2 lines 25-65, *scores for the probability of a correct translation*

are determined for the categories and associated formal commands); and

Decoding the command in accordance with the winning handler (column 2 lines

25-65, *scores for the probability of a correct translation are determined for the*

categories, then the highest scoring category, including the associated formal

command, are passed to the next translator level).

As per claim 4, **Ramaswamy** discloses the method as recited in claim 1, wherein the

handlers include an enabled or a disabled state and further comprising the step of

presenting the utterance to enabled handlers (column 8 lines 25-44), *the utterance is*

compared to categories at translator levels, therefore it is inherent that they are

enabled).

As per claim 10, *Ramaswamy* discloses the method as recited in claim 1, wherein the step of decoding further includes executing a command in accordance with the winning handler, responsive to the utterance (column 2 lines 25-40, *scores for the probability of a correct translation are determined for the categories, then the category and corresponding formal language command having the highest score is chosen, and passed to the next translator level. After the last level of translation, the formal language command is output to control an application*).

As per claim 11, *Ramaswamy* discloses a computer-readable medium, tangibly embodying a program of instructions executable by a computer to perform method step for recognizing commands in natural language as recited in claim 1 (column 1 lines 40-46).

As per claim 12, *Ramaswamy* discloses a method for recognizing commands in natural language, comprising the steps of:

Providing a plurality of handlers trained to be responsive to given utterances (column 2 lines 25-65 and column 3 lines 10-20, *an input utterance is translated using a natural language understanding engine comprised of a plurality of translator levels. Each level contains a plurality of categories with associated formal language commands stored as models (handlers). The categories with the associated formal language*

commands are compared to the input utterance, where the categories are trained from

training data from domain inputs);

Arbitrating against results provided by at least two of the plurality of handlers to

determine a winning handler for an utterance, wherein the results provided at a first

stage by at least one of the at least two of the plurality of handlers include one or more

target utterances for the utterance (column 2 lines 25-65, *scores for the probability of a*

correct translation are determined for the categories and associated formal commands);

and

Decoding the command in accordance with the winning handler (column 2 lines

25-65, *scores for the probability of a correct translation are determined for the*

categories, then the highest scoring category, including the associated formal

command, are passed to the next translator level).

As per claim 15, this claim has limitations similar to claim 4, and is rejected for the same

reason.

As per claim 21, this claim has limitations similar to claim 10, and is rejected for the

same reason.

As per claim 22, this claim has limitations similar to claim 11, and is rejected for the

same reason.

As per claim 23, **Ramaswamy** discloses a system for recognizing commands in natural

language, comprising:

A speech recognizer for decoding language and semantic information in

utterances provided by a user (column 4 lines 61-67); and

A dialog manager comprising a hierarchical ordering of handlers, each handler

being trained to be responsive to decoded utterances wherein the dialog manager

manages arbitration between results provide by the handlers to determine a winning

handler for an utterance and decodes the command in accordance with the winning

handler, wherein the results provided at a first stage include one or more target

utterances for the utterance (column 2 lines 25-65 and column 3 lines 10-20, *an input*

utterance is translated using a natural language understanding engine comprised of a

plurality of translator levels. Each level contains a plurality of categories with associated

formal language commands stored as models (handlers). The categories with the

associated formal language commands are compared to the input utterance, where the

categories are trained from training data from domain inputs).

As per claim 26, this claim has limitations similar to claim 4, and is rejected for the same

reason.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ramaswamy.

Ramaswamy discloses the method as recited in claims 4 and 15, but *Ramaswamy*

does not disclose submitting the utterance to disabled container handlers to ensure

submission of the utterance to child handlers. However, *Ramaswamy* does disclose

hierarchical translators, where each level performs one portion of the translation and

narrows the search space of formal commands for the subsequent levels (column 5

lines 40-53). Therefore each current level determines enabled or disabled categories,

and thus formal commands, for use in the next level. *Ramaswamy* is also concerned

with developing a robust system, using techniques to improve the accuracy of the NLU

system by checking for translation errors from previous levels (column 8 lines 25 -

column 9 lines 40). Submitting the utterance to disabled handlers is one method of checking for translation errors, since an utterance correctly translated by child handlers of a disabled state and incorrectly translated by child handlers of an enabled state indicates a possible translation error in a parent handler.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to submit the utterance to disabled container handlers to ensure submission to child handlers in *Ramaswamy*, since it would enable the system to check for translation errors, thus improving system performance.

Claims 2, 3, 6, 13, 14, 17, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ramaswamy* in view of *Amirghodsi* (4,974,191).

As per claims 2, 13 and 24, *Ramaswamy* discloses the method as recited in claims 1,12 and 23, however *Ramaswamy* does not disclose wherein the step of identifying includes resolving ties in the arbitration between handlers by employing a tie-breaker handler. *Amirghodsi* discloses a system that classifies objects of speech into classes and resolves a deadlock or tie when it occurs (column 39 lines 11-15). *Amirghodsi* discloses a natural language translation system for a human/computer interface (column 2 lines 15-18), and is therefore analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to resolve ties in the arbitration between handlers by employing a tie-breaker handler in *Ramaswamy*, since it would enable the system to continue

processing after reaching a deadlock, as indicated in *Amirghodsi* (column 39 lines 11-15), thus providing quick resolution of a tie, and increased processing speed.

As per claims 3,14 and 25, *Ramaswamy* in view of *Amirghodsi* disclose the method as recited in claims 2,13 and 24, however *Ramaswamy* does not disclose wherein the tie-breaker handler poses a question to a user to determine the winning handler. *Amirghodsi* discloses a system that classifies objects of speech into classes and resolves a deadlock or tie when it occurs (column 39 lines 11-15), as well as a system that uses questions addressed to the user to gain further information in order to process a user request (column 7 lines 44-55 and 59-62). *Amirghodsi* discloses a natural language translation system for a human/computer interface (column 2 lines 15-18), and is therefore analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have a tie-breaker handler pose a question to a user to determine the winning handler in *Ramaswamy*, since it would enable the system to gather further information, as indicated in *Amirghodsi* (column 7 lines 59-62), which would then be used to determine the correct handler, thus providing quick resolution of a tie, and increased processing speed.

As per claims 6 and 17, *Ramaswamy* discloses the method as recited in claims 1 and 12, however *Ramaswamy* does not disclose further comprising the step of submitting unresolved utterances to winning handlers of a previous utterance for decoding.

Amirghodsi discloses a system that classifies objects of speech into classes and

resolves a deadlock or tie when it occurs by assigning the last class reference to the

remaining objects (column 39 lines 11-15). *Amirghodsi* discloses a natural language

translation system for a human/computer interface (column 2 lines 15-18), and is

therefore analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to submit unresolved utterances to winning handlers of a previous

utterance for decoding in *Ramaswamy*, since it would enable the system to continue

processing in the case of a deadlock or tie, as indicated in *Amirghodsi* (column 39

lines 11-15).

Claims 7-9, 18-20 and 27-29 are rejected under 35 U.S.C. 103(a) as being

unpatentable over *Ramaswamy* in view of *Ramaswamy2* ("A Pervasive Conservational

interface for information interaction" Eurospeech 99).

As per claims 7,18 and 27, *Ramaswamy* discloses the method as recited in claims 1,12

and 23, however *Ramaswamy* does not disclose the step of maintaining a database of

a history of handler selections. *Ramaswamy2* discloses a system that maintains a

database of a history of handler selections (section 2.2 Conversational System, third

paragraph, *a multimodal history captures all conversational and graphical system*

events, and keeps track of the system state).

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to maintain a database of a history of handler selections in

Ramaswamy, in order to improve the natural language understanding system for the

predictable result of enabling standard disambiguation and reference resolution,

especially when many transactions are open, as indicated in *Ramaswamy2* (section 2.2

Conversational System, third and fifth paragraphs).

As per claims 8,19 and 28, *Ramaswamy* in view of *Ramaswamy2* disclose the method

as recited in claims 7,18 and 27, however *Ramaswamy* does not disclose wherein the

history includes time based ordering and ontological information. *Ramaswamy2*

discloses wherein the history includes time based ordering and ontological information

(section 2.2 Conversational System, third paragraph, *a multimodal history captures all*

conversational and graphical system events, and keeps track of the system state).

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to use a history that includes time based ordering and ontological

information in *Ramaswamy*, in order to improve the natural language understanding

system for the predictable result of enabling standard disambiguation and reference

resolution, especially when many transactions are open, as indicated in *Ramaswamy2*

(section 2.2 Conversational System, third and fifth paragraphs).

As per claims 9,20 and 29, *Ramaswamy* in view of *Ramaswamy2* disclose the method as recited in claims 7,18 and 27, however *Ramaswamy* does not disclose the step of resolving unresolved utterances by employing information stored in the database. *Ramaswamy2* discloses resolving unresolved utterances by employing information stored in the database (section 2.2 Conversational System, sixth paragraph, *the multimodal history is used for disambiguation and reference resolution*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the information stored in the database to resolve unresolved utterances in *Ramaswamy*, in order to improve the natural language understanding system for the predictable result of enabling standard disambiguation and reference resolution especially when many transactions are open, as indicated in *Ramaswamy2* (section 2.2 Conversational System, third and fifth paragraphs).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dorothy Sarah Siedler whose telephone number is 571-270-1067. The examiner can normally be reached on Mon-Thur 9:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSS

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